cient for which a lens moves on the eye is 0.27×10^{-6} cm^2/sec. The highest value of Hydrodell Water Permeability Coefficient for a lens which binds on the eye is 0.08×10^{-6} cm^2/sec. Thus, a contact lens preferably has a Hydrodell Water Permeability Coefficient greater than about 0.08×10^{-6} cm^2/sec., more preferably greater than 0.27×10^{-6} cm^2/sec.

The invention has been described in detail, with reference to certain preferred embodiments, in order to enable the reader to practice the invention without undue experimentation. Theories of operation have been offered to better enable the reader to understand the invention, but such theories do not limit the scope of the invention. In addition, a person having ordinary skill in the art will readily recognize that many of the previous components, compositions, and parameters may be varied or modified to a reasonable extent without departing from the scope and spirit of the invention.

Furthermore, titles, headings, example materials or the like are provided to enhance the reader's comprehension of this document, and should not be read as limiting the scope of the present invention. Accordingly, the intellectual property rights to the invention are defined by the following claims, reasonable extensions and equivalents thereof, as interpreted in view of the disclosure herein.

That which is claimed is:

1. An ophthalmic lens having ophthalnically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(a) at least one oxyperm polymerizable material and

(b) at least one ionoperm polymerizable material,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during a period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizablea material forms a phase or phases substantially seperate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially hared and wearer comfort is acceptable during a period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polyrnerizable material, if polymerized alone would form a hydrophilic polymer having a water content of atleast 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characteized either by (1) an Ionoton Ion Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec. or(2) an Ionoflux Diffusion Coefficient of greater than about $1.5\times10^{31\ 6}$ mm^2/min. wherein said ion permeability is measured with respect to sodium ions.

2. An ophthalmic lens of claim **1**, wherein said ophthalmic lens is selected from the group consisting of contact lenses for vision correction, contact lenses for eye color modification, ophthalmic drug delivery devices, and ophthalmic wound healing devices.

3. An ophthalmic lens of claim **2**, wherein said ophthalmic lens is a contact lens.

4. An ophthalmic lens of claim **1**, wherein said ophthalmic lens has an oxygen transmissibility of at least about 75 barrers/mm.

5. An ophthalmic lens of claim **4**, wherein said ophthalmic lens has an oxygen transmissibility of at least about 87 barrers/mm.

6. An ophthalmic lens of claim **1**, wherein said polymeric material comprises an ionoperm phase which extends continuously from the inner surface of the ophthalmic lens to the outer surface of the ophthalmic lens.

7. An ophthalmic lens of claim **1**, wherein said polymeric material comprises an oxyperm phase which extends continuously from the inner surface of the ophthalmic lens to the outer surface of the ophthalmic lens.

8. An ophthalmic lens of claim **1**, wherein said polymeric material comprises a plurality of co-continuous phases, including at least one oxyperm phase which extends continuously from the inner surface of the ophthalmic lens to the outer surface of the ophthalmic lens and at least one ionoperm phase which extends continuously from the inner surface of the ophthalmic lens to the outer surface of the ophthalmic lens.

9. An ophthalmic lens of claim **1**, wherein said polymeric material comprises at least one ion or water pathway which extends continuously from the inner surface of the ophthalmic lens to the outer surface of the ophthalmic lens.

10. An ophthalmic lens of claim **1**, wherein said polymeric material comprises at least one oxygen pathway which extends continuously from the inner surface of the ophthalmic lens to the outer surface of the ophthalmic lens.

11. An ophthalmic lens of claim **1**, wherein said polymeric material comprises a plurality of co-continuous pathways, at least one being an ion or water pathway and at least one other being an oxygen pathway, which pathways extend continuously from the inner surface of the lens to the outer surface of the lens.

12. An ophthalmic lens of claim **11**, wherein said co-continuous pathways include a continuous phase of ionoperm polymeric material and a continuous phase of siloxane-containing polymeric material.

13. An ophthalmic lens of claim **11**, wherein said pathways have a domain size which is less than a size which undesirably distorts visible light in an amount which is visible to the eye of the wearer.

14. An ophthalmic lens of claim **1**, wherein said lens has an Ionoton Ion Permeability Coefficient of greater than about 0.3×10^{-6} cm^2/sec and wherein said Ionoton Ion Permeability Coefficient is measured with respect to sodium ions.

15. An ophthalmic lens of claim **14**, wherein said lens has an Ionoton Ion Permeability Coefficient of greater than about 0.4×10^{-6} cm^2/sec and wherein said Ionoton Ion Permeability Coefficient is measured with respect to sodium ions.

16. An ophthalmic lens of claim **1**, wherein said lens has an Ionoflux Diffusion Coefficient of greater than about 2.6×10^{-6} mm^2/min and wherein said Ionoflux Ion Permeability Coefficeint is measured with respect to sodium ions.

17. An ophthalmic lens of claim **16**, wherein said lens has an Ionoflux Diffuision Coefficient of greater than about 6.4×10^{-6} mm^2/min and wherein said Ionoflux Ion Permeability Coefficient is measured with respect to sodium ions.

18. An ophthalmic lens of claim **1**, wherein said lens has a Hydrodell Water Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec.

19. An ophthalmic lens of claim **18**, wherein said lens has a Hydrodell Water Permeability Coefficient of greater than about 0.3×10^{-6} cm^2/sec.

20. An ophthalmic lens of claim **19**, wherein said lens has a Hydrodell Water Permeability Coefficient of greater than about 0.4×10^{-6} cm^2/sec.

21. An ophthalmic lens of claim **1**, wherein when hydrated, said lens has an equilibrium water content of less than about 32 weight percent when tested in accordance with the Bulk Technique.

22. An ophthalmic lens of claim **21**, wherein when hydrated, said lens has an equilibrium water content of about 10 to about 30 weight percent when tested in accordance with the Bulk Technique.

23. An ophthalmic lens of claim **22**, wherein when hydrated, said lens has an equilibrium water content of about 15 to about 25 weight percent when tested in accordance with the Bulk Technique.

24. An ophthalmic lens of claim **1**, wherein said polymeric material is formed from a polymerizable mixture comprising:

(a) about 60 to about 85 weight percent oxyperm macromer; and

(b) about 15 to about 40 weight percent ionoperm monomer.

25. An ophthalmic lens of claim **24**, wherein said polymeric material is formed from a polymerizable mixture comprising:

(a) about 70 to about 82 weight percent oxyperm macromer; and

(b) about 18 to about 30 weight percent ionoperm monomer.

26. An ophthlamic lens of claim **1**, wherein said lens allows oxygen transmission in an amount sufficient to prevent any clinically signficant corneal swelling during a period of extended, continuous contact with ocular tissue and ocular fluids.

27. An ophthalmic lens of claim **1**, wherein said lens produces, after wear of about 24 hours, including normal sleep periods, less than about 8% corneal swelling.

28. An ophthalmic lens of claim **27**, wherein said lens produces, after wear of about 24 hours, including normal sleep periods, less than about 6% corneal swelling.

29. An ophthalmic lens of claim **28**, wherein said lens produces, after wear of about 24 hours, including normal sleep periods, less than about 4% corneal swelling.

30. An ophthalmic lens of claim **1**, wherein said period of extended continuous contact is at least 24 hours.

31. An ophthalmic lens of claim **30**, wherein said period of extended continuous contact is at least 4 days.

32. An ophthalmic lens of claim **31**, wherein said period of extended continuous contact is at least 7 days.

33. An ophthalmic lens of claim **32**, wherein said period of extended continuous contact is at least 14 days.

34. An ophthalmic lens of claim **33**, wherein said period of extended continuous contact is at least 30 days.

35. An ophthalmic lens of claim **1**, wherein said lens has a tensile modulus of 3 MPa or less.

36. An ophthalmic lens of claim **1**, wherein said lens has a short relaxation time constant of greater than about 3.5 seconds, wherein said short relaxation time constant is measured in phosphate-buffered saline solution.

37. An ophthalmic lens of claim **26**, wherein said lens has an Ionoton Ion Permeability Coefficient, P, of greater than about 0.2×10^{-6} cm^2/sec, wherein said short relaxation time constant is measured in phosphate-buffered saline solution and wherein said Ionoton Ion Permeability Coefficient is measured with respect to sodium ions.

38. An ophthalmic lens of claim **26**, wherein said lens has an Ionoflux Diffusion Coefficient of greater than about 2.6×10^{-6} mm^2/min, wherein said short relaxation time constant is measured in phosphate-buffered saline solution and wherein said Ionoton Ion Permeability Coefficient is measured with respect to sodium ions.

39. An ophthalmic lens of claim **36**, wherein said lens has a Hydrodell Water Permeability Coefficient of greater than about $0.2\times10^{-6}cm^2$/min, wherein said short relaxation time constant is measured in phosphate-buffered saline solution.

40. An ophthalmic lens of claim **1**, wherein the polymeric material has a tan δ above about 0.25 at about 10 Hz, wherein said short relaxation time constant is measured in phosphate-buffered saline solution.

41. An ophthalmic lens of claim **1**, wherein said lens has an Ionoton Ion Permeability Coefficient of greater than about 0.3×10^{-6} cm^2/sec, a tensile modulus of 3 MPa or less, and a short relaxation time constant of greater than about 3.5 seconds, wherein said short relaxation time constant is measured in phosphate-buffered saline solution and wherein said Ionoton Ion Permeability Coefficient is measured with respect to sodium ions.

42. An ophthalmic lens of claim **1**, wherein said lens has an Ionoflux Diffusion Coefficient of greater than about 2.6×10^{-6} mm^2/min., a tensile modulus of 3 MPa or less, and a short relaxation time constant of greater than about 3.5 seconds, wherein said short relaxation time constant is measured in phosphate-buffered saline solution and wherein said Ionoflux Ion Permeability Coefficient is measured with respect to sodium ions.

43. An ophthalmic lens of claim **1**, wherein said lens has a Hydrodell Water Permeability Coefficient of greater than about 0.3×10^{-6} cm^2/min., a tensile modulus of 3 MPa or less, and a short relaxation time constant of greater than about 3.5 seconds, wherein said short relaxation time constant is measured in phosphate-buffered saline solution.

44. An ophthalmic lens having ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising at least one polymerizable material comprising:

(a) at least one oxyperm segment; and

(b) at least one ionoperm segment,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during a period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable mateerial forms a phase or phases substantially separate from the phase of phase formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during a period of extended, continuous contact with ocular tissue and ocular fluids,

Wherein said ionoperm polymerizable material, if polymerized alone, would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

Wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized either by (1) an Ionoton Ion Permeability Coeffecient of greater than about0.2×10^{31}

6 cm^2/sec. or (2) an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2min. Wherein said ion permeability is measured with respect to sodiumn ions.

45. An ophthalmic lens of claim **44**, wherein said ophthalmic lens has an oxygen transmissibility of at least about 75 barrers/mm.

46. An ophthalmic lens of claim **45**, wherein said ophthalmic lens has an oxygen transmissibility of at least about 87 barrers/mm.

47. An ophthalmic lens of claim **44**, wherein said lens has an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2/min and wherein said Ionoflux Ion Pemeability Coefficient is measured with respect to sodium ions.

48. An ophthalmic lens of claim **44**, wherein said lens has a Hydrodell Water Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec.

* * * * *

US005760100B1

REEXAMINATION CERTIFICATE (4202nd)

United States Patent [19] [11] **B1 5,760,100**

Nicolson et al. [45] Certificate Issued **Nov. 14, 2000**

[54] **EXTENDED WEAR OPHTHALMIC LENS**

[75] Inventors: **Paul Clement Nicolson**, Dunwoody; **Richard Carlton Baron**, Alpharetta, both of Ga.; **Peter Chabrecek**, Basel, Switzerland; **John Court**, Ultimo, Australia; **Angelika Domschke**, Lörrach, Germany; **Hans Jörg Griesser**, The Patch; **Arthur Ho**, Randwick, both of Australia; **Jens Höpken**, Lörrach, Germany; **Bronwyn Glenice Laycock**, Heidelberg Heights, Australia; **Qin Liu**, Duluth, Ga.; **Dieter Lohmann**, Munchestein, Switzerland; **Gordon Francis Meijs**, Murrumbeena; **Eric Papaspiliotopoulos**, Paddington, both of Australia; **Judy Smith Riffle**, Blacksburg, Va.; **Klaus Schindhelm**, Cherrybrook; **Deborah Sweeney**, Roseville, both of Australia; **Wilson Leonard Terry, Jr.**, Alpharetta, Ga.; **Jürgen Vogt**, Fribourg, Switzerland; **Lynn Cook Winterton**, Alpharetta, Ga.

[73] Assignees: **Ciba Vision Corporation**, Duluth, Ga.; **Commonwealth Scientific and Industrial Research Organisation**, Campbell, Australia

Reexamination Request:
No. 90/005,283, Mar. 5, 1999

Reexamination Certificate for:

Patent No.:	**5,760,100**
Issued:	**Jun. 2, 1998**
Appl. No.:	**08/569,816**
Filed:	**Dec. 8, 1995**

Certificate of Correction issued Jun. 15, 1999.

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/301,166, Sep. 6, 1994, abandoned.

[30] **Foreign Application Priority Data**

Apr. 4, 1995 [DE] Germany 95810221.2
May 19, 1995 [CH] Switzerland 1496/95

[51] **Int. Cl.**[7] **G02B 1/04**; G02C 7/04; C08G 18/61; C08L 75/04; C08L 83/04

[52] **U.S. Cl.** ..... **523/106**; 523/107; 525/101; 525/477; 525/903; 525/936; 525/937; 528/28; 528/32; 528/33; 528/45; 351/160 H; 351/247

[58] **Field of Search** 523/106, 107; 525/477, 937; 528/28, 32, 33, 45

[56] **References Cited**

U.S. PATENT DOCUMENTS

Re. 31,406	10/1983	Gaylord .	
2,718,516	9/1955	Bortnick .	
3,284,406	11/1966	Nelson .	
3,518,324	6/1970	Polmanteer .	
3,700,573	10/1972	Laizler .	
3,708,225	1/1973	Misch et al. .	
3,808,178	4/1974	Gaylord .	
3,894,129	7/1975	Hoffman et al.	264/1
3,916,033	10/1975	Merrill .	
3,935,342	1/1976	Lim .	

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

0114894A1	7/1983	European Pat. Off. .
0108886A2	9/1983	European Pat. Off. .
0184729B1	11/1985	European Pat. Off. .
0277771A3	1/1988	European Pat. Off. .
0 295 947 A3	6/1988	European Pat. Off. .
0295947A3	6/1988	European Pat. Off. .
0170141B1	7/1988	European Pat. Off. .
0306756A2	8/1988	European Pat. Off. .
030675B1	8/1988	European Pat. Off. .
0330616A1	2/1989	European Pat. Off. .
0395583A2	4/1990	European Pat. Off. .
0425436A3	10/1990	European Pat. Off. .

(List continued on next page.)

OTHER PUBLICATIONS

The Journal of Clinical Pharmacology and Therapeutics, vol. 58, No. 5, p. 604. Nov. 1995 edition, which contained the structural formula for Balafilicon A and which was publicly available in Nov. 1995 in the United States (Exhibit A).

The publication in Chemistry and Industry of an article by Kunzler entitled "Contact Lens Materials", Aug. 21, 1995, pp. 651–655 and which was publicly available from Oct. 19, 1995 at the University of New South Wales Library (Exhibit B).

The publication of an article in the Journal of Applied Polymer Science, vol. 55 (1995), pp. 611–619, by Kunzler et al. entitled "Hydrogels Based on Hydrophilic Side–Chain Siloxanes", and which was publicly available from Feb. 21, 1995 at the University of New South Wales Library (Exhibit C).

An article in World Plastics and Rubber Technology (1992), pp. 23–29, entitled "Clear Vision for the Future" by Lai et al. was publicly available from Nov. 16, 1992 at the State Library of New South Wales (Exhibit D).

(List continued on next page.)

Primary Examiner—Vasudevan S. Jagannathan

[57] **ABSTRACT**

An ophthalmic lens suited for extended-wear for periods of at least one day on the eye without a clinically significant amount of corneal swelling and without substantial wearer discomfort. The lens has a balance of oxygen permeability and ion or water permeability, with the ion or water permeability being sufficient to provide good on-eye movement, such that a good tear exchange occurs between the lens and the eye. A preferred lens is a copolymerization product of a oxyperm macromer and an ionoperm monomer. The invention encompasses extended wear contact lenses, which include a core having oxygen transmission and ion transmission pathways extending from the inner surface to the outer surface.

U.S. PATENT DOCUMENTS

3,959,102	5/1976	Wajs et al. .
3,959,105	5/1976	Feneberg et al. .
3,996,187	12/1976	Travnicek .
4,008,198	2/1977	Krohberger et al. .
4,062,627	12/1977	Wajs et al. .
4,095,878	6/1978	Fanti .
4,099,859	7/1978	Merrill .
4,112,207	9/1978	Jones .
4,114,993	9/1978	Travnicek .
4,120,570	10/1978	Gaylord .
4,128,318	12/1978	Sieglaff et al. .
4,136,250	1/1979	Mueller et al. .
4,143,949	3/1979	Chen .
4,152,508	5/1979	Ellis et al. .
4,153,641	5/1979	Deichert et al. .
4,156,066	5/1979	Gould .
4,156,067	5/1979	Gould .
4,166,255	8/1979	Graham .
4,169,119	9/1979	Covington .
4,182,822	1/1980	Chang .
4,186,026	1/1980	Rotenberg et al. .
4,189,546	2/1980	Deichert et al. .
4,195,030	3/1980	Deichert et al. .
4,197,266	4/1980	Clark et al. .
4,198,131	4/1980	Birdsall et al. .
4,208,362	6/1980	Deichert et al. .
4,208,506	6/1980	Deichert et al. .
4,214,014	7/1980	Höfer et al. .
4,217,038	8/1980	Letter et al. .
4,225,631	9/1980	Berger et al. .
4,228,269	10/1980	Loshaek et al. .
4,229,273	10/1980	Wajs .
4,242,483	12/1980	Novicky .
4,245,069	1/1981	Covington .
4,254,248	3/1981	Friends et al. .
4,259,467	3/1981	Keogh et al. .
4,260,725	4/1981	Keogh et al. .
4,261,875	4/1981	LeBoeuf .
4,276,402	6/1981	Chromecek et al. .
4,277,595	7/1981	Deichert et al. .
4,291,953	9/1981	Covington .
4,294,974	10/1981	LeBoeuf .
4,303,772	12/1981	Novicky .
4,312,575	1/1982	Peyman et al. .
4,322,517	3/1982	Deubzer et al. .
4,327,203	4/1982	Deichert et al. .
4,332,922	6/1982	Kossmehl et al. .
4,341,889	7/1982	Deichert et al. .
4,355,135	10/1982	January .
4,355,147	10/1982	Deichert et al. .
4,359,558	11/1982	Gould et al. .
4,365,050	12/1982	Ivani .
4,395,496	7/1983	Wittmann et al. .
4,408,023	10/1983	Gould et al. .
4,410,674	10/1983	Ivani .
4,413,104	11/1983	Deubzer et al. .
4,423,195	12/1983	Covington .
4,424,305	1/1984	Gould et al. .
4,436,887	3/1984	Chromecek et al. .
4,439,583	3/1984	Gould et al. .
4,439,584	3/1984	Gould et al. .
4,439,585	3/1984	Gould et al. .
4,440,918	4/1984	Rice et al. .
4,447,562	5/1984	Ivani .
4,454,295	6/1984	Wittmann et al. .
4,454,309	6/1984	Gould et al. .
4,463,149	7/1984	Ellis .
4,478,981	10/1984	Arkles .
4,486,577	12/1984	Mueller et al. .
4,487,905	12/1984	Mitchell .
4,495,361	1/1985	Friends et al. .
4,496,535	1/1985	Gould et al. .
4,500,676	2/1985	Balazs et al. .
4,527,293	7/1985	Eckstein et al. .
4,528,301	7/1985	Upchurch .
4,543,398	9/1985	Bany et al. .
4,546,123	10/1985	Schäfer et al. .
4,550,139	10/1985	Arkles .
4,555,375	11/1985	Kunzler et al. .
4,563,565	1/1986	Kampfer et al. .
4,576,850	3/1986	Martens .
4,582,884	4/1986	Ratkowaki .
4,582,885	4/1986	Barber .
4,602,074	7/1986	Mizutaki et al. .
4,605,712	8/1986	Mueller et al. .
4,616,045	10/1986	Upchurch .
4,625,007	11/1986	Ellis et al. .
4,626,292	12/1986	Sherman .
4,632,844	12/1986	Yanagihara et al. .
4,632,968	12/1986	Yokota et al. .
4,649,184	3/1987	Yoshikawa et al. .
4,649,185	3/1987	Takamizawa et al. .
4,652,622	3/1987	Friends et al. .
4,659,777	4/1987	Riffle et al. .
4,661,573	4/1987	Ratkowski et al. .
4,663,409	5/1987	Friends et al. .
4,664,657	5/1987	Williamitis et al. .
4,665,145	5/1987	Yokota et al. .
4,666,249	5/1987	Bauman et al. .
4,668,558	5/1987	Barber .
4,696,974	9/1987	Sulc et al. .
4,703,097	10/1987	Wingler et al. .
4,711,943	12/1987	Harvey, III .
4,727,172	2/1988	Yamamoto et al. .
4,731,080	3/1988	Galin .
4,732,715	3/1988	Bawa et al. .
4,737,322	4/1988	Bruns et al. .
4,737,558	4/1988	Falcetta et al. .
4,740,533	4/1988	Su et al. .
4,743,667	5/1988	Mizutani et al. .
4,752,627	6/1988	Froix .
4,769,431	9/1988	Ratkowski .
4,780,488	10/1988	Su et al. .
4,780,515	10/1988	Deichert .
4,792,414	12/1988	Su et al. .
4,803,254	2/1989	Dunks et al. .
4,806,382	2/1989	Goldgerg et al. .
4,810,764	3/1989	Friends et al. .
4,818,801	4/1989	Rice et al. .
4,826,936	5/1989	Eillis .
4,829,137	5/1989	Stoyan .
4,833,262	5/1989	Kunzler et al. .
4,837,289	6/1989	Mueller et al. .
4,840,796	6/1989	Sweet et al. .
4,849,285	7/1989	Dillion .
4,853,453	8/1989	Schafer et al. .
4,857,606	8/1989	Su et al. .
4,859,383	8/1989	Dillion .
4,866,148	9/1989	Geyer et al. .
4,871,785	10/1989	Froix .
4,894,231	1/1990	Moreau et al. .
4,910,277	3/1990	Bambury et al. .
4,920,184	4/1990	Schafer et al. .
4,923,906	5/1990	Mueller et al. .
4,925,668	5/1990	Khan et al. .
4,938,827	7/1990	Leach et al. .
4,940,751	7/1990	Frances et al. .
4,943,150	7/1990	Deichert et al. .
4,943,460	7/1990	Markel et al. .
4,948,485	8/1990	Wallsten et al. .
4,948,855	8/1990	Novicky .
4,948,907	8/1990	Fleischmann et al. .
4,954,586	9/1990	Toyoshima et al. .
4,954,587	9/1990	Mueller .
4,961,954	10/1990	Goldbert et al. .
4,962,178	10/1990	Harisiades .
4,977,229	12/1990	Culberson et al. .
4,983,332	1/1991	Hahn et al. .
4,983,702	1/1991	Mueller et al. .
5,002,979	3/1991	Stoyan .

5,006,622	4/1991	Kunzler et al. .	
5,008,115	4/1991	Lee et al. .	
5,010,141	4/1991	Mueller .	
5,011,275	4/1991	Mueller .	
5,013,808	5/1991	Piskoti .	
5,019,628	5/1991	Spinelli .	
5,023,305	6/1991	Onozuka et al. .	
5,032,658	7/1991	Baron et al. .	
5,034,461	7/1991	Lai et al.	525/100
5,039,769	8/1991	Molock et al. .	
5,053,048	10/1991	Pinchik .	
5,057,578	10/1991	Spinelli .	
5,062,995	11/1991	Wu et al. .	
5,070,169	12/1991	Robertson et al. .	
5,070,170	12/1991	Robertson et al. .	
5,070,215	12/1991	Bambury et al. .	
5,073,583	12/1991	Broderick .	
5,074,877	12/1991	Nordan .	
5,077,335	12/1991	Schwabe et al. .	
5,079,878	1/1992	Druskis et al. .	
5,080,839	1/1992	Kindt-Larsen .	
5,080,924	1/1992	Kamel et al. .	
5,084,537	1/1992	Stoyan .	
5,091,204	2/1992	Ratner et al. .	
5,094,876	3/1992	Goldberg et al. .	
5,098,618	3/1992	Zelez .	
5,100,689	3/1992	Goldberg et al. .	
5,104,213	4/1992	Wolfson .	
5,106,930	4/1992	Gupta .	
5,115,056	5/1992	Mueller et al. .	
5,116,369	5/1992	Kushibiki et al. .	
5,128,408	7/1992	Tanaka et al. .	
5,128,434	7/1992	Lai .	
5,135,297	8/1992	Valint, Jr. .	
5,141,748	8/1992	Rizzo .	
5,147,396	9/1992	Kageyama et al. .	
5,154,861	10/1992	McBriety et al. .	
5,157,093	10/1992	Harisiades et al. .	
5,158,573	10/1992	Berg .	
5,158,717	10/1992	Lai .	
5,160,597	11/1992	Colapicchioni et al. .	
5,162,396	11/1992	Hilty et al. .	
5,162,469	11/1992	Chen .	
5,166,298	11/1992	Friedmann et al. .	
5,171,607	12/1992	Cumbo .	
5,171,809	12/1992	Hilty et al. .	
5,177,165	1/1993	Valint, Jr. et al. .	
5,177,167	1/1993	Tone et al. .	
5,196,493	3/1993	Gruber et al. .	
5,219,965	6/1993	Valint, Jr. et al. .	
5,236,969	8/1993	Kunzler et al. .	
5,238,613	8/1993	Anderson .	
5,260,000	11/1993	Nandu et al. .	
5,260,001	11/1993	Nandu et al. .	
5,264,161	11/1993	Druskis et al. .	
5,270,418	12/1993	Kunzler et al. .	
5,271,875	12/1993	Appelton .	
5,274,008	12/1993	Lai .	
5,298,533	3/1994	Nandu et al. .	
5,310,779	5/1994	Lai .	
5,314,960	5/1994	Spinelli et al.	525/280
5,321,108	6/1994	Kunzler et al. .	
5,334,681	8/1994	Mueller et al. .	
5,336,797	8/1994	McGee et al. .	
5,346,946	9/1994	Yokoyama et al. .	
5,352,714	10/1994	Lai et al. .	
5,357,013	10/1994	Bambury et al. .	
5,358,995	10/1994	Lai et al. .	
5,364,918	11/1994	Valint, Jr. et al. .	
5,371,147	12/1994	Spinelli et al.	525/288
5,374,662	12/1994	Lai et al. .	
5,378,412	1/1995	Smith et al. .	
5,387,632	2/1995	Lai et al. .	
5,387,662	2/1995	Kunzler et al. .	
5,387,663	2/1995	McGee et al. .	
5,420,324	5/1995	Lai et al. .	
5,435,943	7/1995	Adams et al. .	
5,449,729	9/1995	Lai	526/286
5,451,617	9/1995	Lai et al. .	
5,451,651	9/1995	Lai .	
5,453,467	9/1995	Bamford et al. .	
5,456,864	10/1995	Wickes et al. .	
5,466,147	11/1995	Appelton et al. .	
5,486,579	1/1996	Lai et al. .	
5,496,871	3/1996	Lai et al. .	
5,512,205	4/1996	Lai	252/182.14
5,525,691	6/1996	Valint, Jr. et al. .	
5,534,605	7/1996	Bambury et al. .	
5,539,016	7/1996	Kunzler et al. .	
5,563,184	10/1996	McGee et al. .	
5,610,252	3/1997	Bambury et al. .	
5,629,360	5/1997	Askari et al. .	
5,726,733	3/1998	Lai .	
5,804,107	8/1998	Martin et al.	264/1.36
5,965,631	10/1999	Nicolson et al. .	

FOREIGN PATENT DOCUMENTS

0461270A1	12/1990	European Pat. Off. .
0489185A1	12/1990	European Pat. Off. .
0439429A2	1/1991	European Pat. Off. .
0 443 005	4/1991	European Pat. Off. .
0480238A1	9/1991	European Pat. Off. .
0497204A2	1/1992	European Pat. Off. .
0528664A1	8/1992	European Pat. Off. .
0584764A1	8/1993	European Pat. Off. .
0614921A2	3/1994	European Pat. Off. .
0620455A2	4/1994	European Pat. Off. .
0687550A2	6/1994	European Pat. Off. .
0643083A1	9/1994	European Pat. Off. .
0686491A2	6/1995	European Pat. Off. .
0735097A1	3/1996	European Pat. Off. .
0781777A1	12/1996	European Pat. Off. .
0782016A2	12/1996	European Pat. Off. .
6-122779	5/1994	Japan .
WO90/09013	8/1990	WIPO .
WO92/07013	4/1992	WIPO .
WO 94/15980	7/1994	WIPO .
WO94/15980	7/1994	WIPO .
WO95/17689	6/1995	WIPO .
WO95/20476	8/1995	WIPO .
WO95/24187	9/1995	WIPO .

OTHER PUBLICATIONS

An article in the Journal of Applied Polymer Science, vol. 56 (1995) entitles "Role of Bulky Polysilaxanylalkyl Methocrylates in Oxygen–Permeable Hydrogel Materials" by Lai et al. and which was publicly available in Apr. 1995 in the United States (Exhibit E).

An article in the Journal of Applied Polymer Science, vol. 56 (1995) entitled "Novel Polyurethane—Silicone Hydrogels" by Lai which was publicly available in Apr. 1995 in the United States (Exhibit F).

An article in Macromolecular Engineering (1995) entiteld "Transparent Multiphasic Oxygen Permeable Hydrogels based on Silaxanic Statistical Copolymers" by Robert et al, which was publicly available in Aug. 1995 in the United States (Exhibit G).

An article in Trends in Polymer Science entitled "Silicone Hydrogels for Contact Lens Application" by Jay F. Kunzler which was publicly available in Feb. 1996 in the United Kingdom (Exhibit H).

An article in the Contact Lens Association of Ophthalmologists Journal ("CLAO"), vol. 13, No. 1 (Jan. 1987) entitled "Gas Permeable Hard Contact Lens Extended Wear: Ocular and Visual Responses to a 6–Month Period of Wear" by Kenneth A. Polse et al., which was publicly available in Jan. 1987 in the United States of America (Exhibit I).

An article in the Contact Lens Association of Ophthalmologists Journal ("CLAO"), vol. 15, No. 2 (Apr. 1989) entitled "Paraperm® EW Lens for Extended Wear" by James E. Key et al., which was publicly available in Apr. 1989 in the United States of America (Exhibit J).

The publication of an article in Biomaterials, vol. 4 (Oct. 1983) entitled "Gas–to–Liquid permeation in silicon–containing crosslinked, glassy copolymers of methyl methacrylate" by Wu–Huang, Michael Yang, et al. which was publicly available in Oct. 1983 in the United States of America (Exhibit K).

The publication of an article in Macromolecular Symposia, vol. 98 entitled "Recent Advances in the Design of Polymers for Contact Lenses" by Gary D. Friends, et al., which was publicly available in Jul. 1995 in the United States of America (Exhibit L).

An article in The British Polymer Journal (Dec. 1976) entitled "Polymers in Contact Lens Applications VI, the 'Dissolved' Oxygen Permeability of Hydrogels and the Design of Materials for use in Continuous–Wear Lenses" by Chiong O. Ng et al., which was publicly available in Dec. 1976 in the United Kingdom (Exhibit M).

An article in the Journal of Japan Contact Lens Society, vol. 21, No. 5 (1979) entitled "Physical Properties of High Water Combined Lens Materials, Compared with Rabbit's Cornea" by Yujl Kosaka et al., which was publicly available in 1979 in Japan (Exhibit N).

The *Medical Device Approval Letter,* vol. IV, No. 1, which was publicly available on line through a number of databases including DIALOG and LEXIS in Jan. 1995 (Exhibit O).

The *Medical Devices, The Diagnostics & Instrumentation Report—"The Grey Sheet",* vol. 21, No. 4, dated Jan. 23, 1995 which was publicly available on line through a number of databases including DIALOG and LEXIS in about Jan. 1995 (Exhibit P).

The B&L US 510(k) application filed with the U.S. Food and Drug Administration ("USFDA") for the Premier 90 (Balafilicon A) contact lens which application was publicly available from the USFDA from Jan. 1995 (Exhibit Q).

Weissman et al., "Cancellation of the Boundary and Edge Effects by Choice of Lens Thickness during Oxygen Permeability Measurement of Contact Lens", Optometry & Vision Science, vol. 66, No. 5, pp. 264–268, (1989).

Hamano et al., "A Study of the Complications Induced by Conventional and Disposable Contact Lenses", The CLAO Journal, vol. 20, pp. 103–110, (1994).

Schein et al., "The Impact of Overnight Wear on the Risk of Contact Lens–Associated Ulcerative Keratitis", Arch. Ophthalmol, vol. 112, pp. 186–190, 91994).

Nilsson et al., "The Hospitalized Cases of Contact Lens Induced Keratitis in Sweden and their Relation to Lens Type and Wear Schedule; Results of a Three–Year Retrospective Study", The CLAO Journal, vol. 20, pp. 97–101, (1994).

Goyal et al., "Corneal Ulcers in Patients with Disposable Extended–Wear Contact Lenses", Ann. Ophthalmol—Glaucoma, vol. 26, pp. 194–199, (1994).

Schein et al., "The Relative Risk of Ulcerative Keratitis Among Users of Daily–Wear and Extended–Wear Soft Contact Lenses", The New England Journal of Medicine, vol. 321, pp. 773–776, (1989).

Solomon et al., "Testing Hypotheses for Risk Factors for Contact Lens–Associate Infectious Keratitis in an Animal Model", The CLAO Journal, vol. 20, pp. 109–113, (1994).

Poggio et al., "Complications and Symptons in Disposable Extended Wear Lenses Compared with Conventional Sofy Daily Wear and Soft Extended Wear Lenses", The CLAO Journal, vol. 19, pp. 31–39, (1993).

Poggio et al., "The Incidence of Ulcerative Keratitis Among Users of Daily–Wear and Extended–Wear Soft Contact Lenses", The New England Journal of Medicine, vol. 321, pp. 779–783, (1989).

McRae et al., "Corneal Ulcer and Adverse Reaction Rates in Premarket Contact Lens Studies", American Journal of Ophthalmology, vol. 111, pp. 457–465, (1991).

Grant et al., "Extended Wear of Hydrogel Lenses", Problems in Optometry, vol. 2, pp. 599–622, (1990).

Brennan et al., "Extended Wear in Perspective", Optometry and Vision Science, vol. 74, 609–623, (1997).

Winterton et al., "Coulometric Method for Measuring Oxygen Flux and Dk of Contact Lenses and Lens Materials", vol. 14, No. 11, 1987, pp. 441–449, (1987).

Winterton et al., "Coulometrically Determined Oxygen Flux and Resultant Dk of Commercially Available Contact Lenses", vol. 15, pp. 117–123, (1988).

Holden et al., "The Dk Project: An Interlaboratory Comparison of Dk/L Measurements", Optometry and Vision Science, vol. 67, pp. 476–481, (1989).

Winterton et al., "Coulometric Method for Measuring Oxygen Flux and Dk of Contact Lenses and Lens Materials", The Cornea: Transactions of The World Congress on The Cornea III, Raven Press, Chapter 47, pp. 273–280, (1988).

Alvord et al., "Oxygen Permeability of a New Type of High Dk Soft Contact Lens Material", Optometry and Vision Science, vol. 75, pp. 30–36, (1998).

Holden et al., "Critical Oxygen Levels to Avoid Corneal Edema for Daily and Extended Wear Contact Lenses", Investigative Opthalmology & Visual Science, vol. 25, pp. 2–8, (1983).

Domschke et al., "Morphology Requirements For On–Eye Mobility of Soft Oxygen Permeable Contact Lenses", Business and Technology Innovation, Ciba Vision.

Kirk Othmer Encyclopedia of Chemical Technology (chapter on contact lenses), pp. 720–741.

Ciba Vision Corporation, a Delaware corporation vs. Bausch & Lomb Incorporated, a New York Corporation—Counter Claims—United States District Court for the Northern District of Georgia (Gainesville)—pp. 22–28 with Exhibit F—Apr. 19, 1999.

Ciba Vision Corporation, a Delaware corporation vs. Bausch & Lomb Incorporated, a New York Corporation—Memorandum in Opposition to CIBA's Motion for a Temporary Restraining Order and a Preliminary Injunction—Unites States District Court for the Northern District of Georgia (Gainesville) pp. 2–17 with Exhibits A–F and J.

In the Federal Court of Australia Victoria District Registry—Defence and Cross–Claim—No. V81 of 2000—Jun. 2, 2000.

Releasable 510(k) No. K972454—Aug. 8, 1997—Lenses, Soft Contact, Daily Wear.

Releasable 510(k) No. K944895—Dec. 8, 1994—Contact Lenses.

Letter from Edward W. Remus to Michael O. Sutton, Esq.—Apr. 4, 2000—RE: CIBA Vision Corporation v. Bausch & Lomb Incorporated.

Letter from Mr. Edward W. Remus of McAndrews, Held & Malloy, Ltd. to Kenneth L. Cage, Esq. at McDermott, Will & Emery—RE: CIBA Vision Corporation v. Bausch & Lomb Incorporated—Jun. 5, 2000.

Letter from Richard T. McCaulley Jr. of McAndrews, Held & Malloy, Ltd., to Michael O. Sutton at Sidley & Austin—RE: CIBA Vision Corp v. Bausch & Lomb Inc. Civil Action No. 99–0034–WCO—Jun. 23, 2000.

Letter from Kenneth L. Cage of McDermott, Will & Emery to Edward W. Remus at AcAndrews, Held & Molloy, LTD.—RE: CIBA Vision Corporation v. Bausch & Lomb Incorporated—May 25, 2000.
Letter from Kenneth L. Cage of McDermott, Will & Emery to Colleague—RE: CIBA Vision Corporation v. Bausch and Lomb, Incorporated U.S. Patent Reexamination Proceedings U.S. Patent Nos. 5,760,100: 5,849,811: 5,789,461; and 5,776,999.
Letter from Carol Kirby of The University of New South Wales to Mr. R. Hearhard at CIBA Vision Corporation—Jul. 7, 2000—RE: Rule 56 Inquiry—UNSW CCLRU.
Letter from Michael O. Sutton of Sidley & Austin to Kenneth Cage at McDermott, Will and Emer and to Richard Gearhart at CIBA Vision Corporation—Jul. 12, 2000—RE: CIBA vision Corporation v. Bausch & Lomb, Inc. (16008/00101).
Letter from Michael O. Sutton to Edward W. Remus, Esq.—Dec. 10, 1999.
Letter from Michael O. Sutton to Edward W. Remus, Esq.—Dec. 14, 1999.
Letter from Edward W. Remus, Esq. to Michael O. Sutton—Dec. 17, 1999.
Letter from Michael O. Sutton to Edward W. Remus, Esq.—Dec. 22, 1999.
Letter from Edward W. Remus,. to Michael O. Sutton—Jan. 3, 2000.
Letter from Michael O. Sutton to Edward W. Remus—Jan. 4, 2000.
Letter from Edward W. Remus to Michael O. Sutton—Jan. 6, 2000.
Letter from Michael O. Sutton to Edward W. Remus—Jan. 12, 2000.
Letter from Russell Wheatley to Edward W. Remus—Jan. 31, 2000.
Letter from Edward W. Remus to Michael O. Sutton—Feb. 2, 2000.
Letter from Edward W. Remus to Michael O. Sutton—Feb. 7, 2000.
Letter from Michael O. Sutton to Edward W. Remus—Feb. 10, 2000.
Letter from Edward W. Remus to Michael O. Sutton—Feb. 18, 2000.
Letter from Michael O. Sutton to Edward W. Remus—Mar. 23, 2000.
Letter from Edward W. Remus to Michael O. Sutton—Mar. 30, 2000.
Letter from Michael O. Sutton to Edward W. Remus—Apr. 3, 2000.
Letter from Michael O. Sutton to Edward W. Remus—Jun. 19, 2000.
Letter from Edward W. Remus to Michael O. Sutton—Jun. 30, 2000.
SILSOFT® (elastofilcon A) Contact Lenses For Aphakic Daily and Extended Wear, Fitting Guide, pp. 1–5, Bausch & Lomb, Sep., 1989.
Edelhauser et al. 'Oxygen, calcium, lactate, chloride, and sodium permeability of soft contact lenses,' in: Gasset et al., 'Soft Contact Lens' (The C. V. Mosby Company, Saint Louis), pp. 37–43, 1972.
Refojo et al., 'Permeability of Dissolved Oxygen through Contact lenses I. Cellulose Acetate Butyrate,' 'Contact and Intraocular Lens Medical Journal,' vol. 3, pp. 27–33, 1977.
Declaration of Dr. David J. Heiler, 1999.
Translation of Japanese patent JP 6–122779, May 1994.
"Hawley's Condensed Chemical Dictionary," Twelfth edition, New York, Van Nostrand Reinhold Co., p. 28, 1993.
Designated "Highlighted" Pages of Deposition of Yu–Chin–Lai, Nov. 17, 1999 (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
R & D Clinical Report, with "Highlighted" Portions, Feb. 7, 1994 (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
Designated "Highlighted" Pages of Deposition of Paul Nicolson, Nov. 10, 1999 (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
Distribution with "Highlighted" Pages (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
Bausch & Lomb Incorporated's Opposition to CIBA Corporation's Motion to Permit Certain Attorney's to have access to Information Under the Stipulated Protective Order (with Exhibits A–J) (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
Defendant Bausch & Lomb Incorporated's Opposition to CIBA Corporation's Motion to Use Evidence from this case at the Reexamination Proceedings (with Exhibits A–J) (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
Memorandum in Support of CIBA's Motion to Use Evidence from this Case in the Reexamination Proceedings ("CIBA Motion") (with Exhibits 1–8) (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
Reply Brief in Support of CIBA VISION Corporation's Motion to use Evidence from this Case in the Reexamination Proceedings ("CIBA Reply") (with Exhibits 1–7) (Note: This Information is Subject to Protective Order—Not Open to Public, Only by Examiner or Other Authorized Patent and Trademark Office Employee).
U.S. Prosecution History of U.S. Pat. No. 5,034,461.
U.S. Prosecution History of U.S. Pat. No. 5,451,617.
U.S. Prosecution History of U.S. Pat. No. 5,486,579.
Mandell, R.., *Contact Lens Practice, Fourth Edition,* Springfield, IL, pp. 520–521 (1988).
Lai, Yu–Chin, "The Role of Bulky Polysiloxanylalkyl Methacrylates in Oxygen Permeable Hydrogel Materials," ACS Workshop–Hyphenated Methods In Polymer Spectroscopy, *Polymeric Materials Science and Engineering,* vol. 69, Fall Meeting, Chicago, IL, pp. 228–231 (1993).
Fatt, I., et al., "Measuring Oxygen Permeablilty of Gas Permeable Hard and Hydrogel Lenses and Flat Samples in Air," vol. 14, No. 10 (Oct. 1987) pp. 389–401 (Oct. 1987).
Lai, Yu, et al., "Surface Wettability Enhancement of Silicone Hydrogel Lenses by Processing with Polar Plastic Molds," *J. of Biomed. Mat. Res.,* vol. 35:3, pp. 349–356 (1997).
Lai, Yu, et al., "Synthesis and Characterization of α,ω–Bis(4–hydroxybutyl) Polydimethylesiloxane," *Polymer Prerints,* 35:2, American Chemical Society (Aug. 1994).

REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

ONLY THOSE PARAGRAPHS OF THE SPECIFICATION AFFECTED BY AMENDMENT ARE PRINTED HEREIN.

Column 11, lines 42–50:

An Ionoflux Diffusion Coefficient of greater than about **[**6.4×10^{-6}**]** *1.5×10^{-6}* mm^2/min is preferred for achieving sufficient on-eye movement. More preferably, the Ionoflux Diffusion Coefficient is greater than about 2.6×10^{-6} mm^2/min, while most preferably, the Ionoflux Diffusion Coefficient is greater than about **[**1.5×10^{-6}**]** *6.4×10^{-6}* mm^2/min. It must be emphasized that the Ionoflux Diffusion Coefficient correlates with ion permeability through the lens, and thereby is a predictor of on-eye movement.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **30** is cancelled.

Claims **1**, **31** and **44** are determined to be patentable as amended.

Claims **2–29**, **32–43** and **45–48**, dependent on an amended claim, are determined to be patentable.

New claims **49–64** are added and determined to be patentable.

1. An ophthalmic lens having *a surface modified by a surface treatment process, said lens having* ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids *while having adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours*, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(a) at least one oxyperm polymerizable material and

(b) at least one ionoperm polymerizable material,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during **[**a**]** *the* period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during **[**a**]** *the* period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized either by (1) an Ionoton Ion Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec**[**.**]** or (2) an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2/min. wherein said ion permeability is measured with respect to sodium ions.

31. An ophthalmic lens of claim **[30]** *1*, wherein said period of extended continuous contact is at least 4 days.

44. An ophthalmic lens having *a surface modified by a surface treatment process, said lens having* ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids *while having adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours*, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising at least one polymerizable material comprising:

(a) at least one oxyperm segment; and

(b) at least one ionoperm segment,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during **[**a**]** *the* period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm segment forms a phase or phases substantially separate from the phase **[**of phase**]** *or phases* formed by said ionoperm segment,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during **[**a**]** *the* period of extended, continuous contact with ocular tissue and ocular fluids,

[Wherein**]** *wherein* said ionoperm segment, if polymerized alone, would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

[Wherein**]** *wherein* said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized either by (1) an Ionoton Ion Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec**[**.**]** or (2) an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2/min, **[**Wherein**]** *wherein* said ion permeability is measured with respect to sodium ions.

49. An ophthalmic lens comprising a core material surrounded, at least in part, by a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces which are more hydrophilic and lipophobic than the core material, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids while providing adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant

corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(a) at least one oxyperm polymerizable material and

(b) at least one ionoperm polymerizable material,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase of phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibiility of at least about 70 barrers/mm and an ion permeability characterized either by (a) an Ionoton Ion Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec, or (2) an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions.

50. An ophthalmic lens comprising a core material surrounded, at least in part, by a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces which are more hydrophilic and lipophobic than the core material, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids while having adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 4 days, said lens comprising a polymeric material which has a high oxygen permeability equal to or greater than about 69 barrers and a high ion permeability, said polymeric material being formed from polymerizable materials polymerized in an atmosphere substantially free of oxygen comprising:

(a) at least one oxyperm polymerizable material and

(b) at least one ionoperm polymerizable material,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized either by (1) an Ionoton Ion Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec or (2) an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions.

51. An ophthalmic lens comprising a core material surrounded, at least in part, by a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces which are more hydrophilic and lipophobic than the core material, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 4 days, said lens comprising a polymeric material which has a high oxygen permeability of equal to or greater than about 72 barrers and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(a) at least one oxyperm polymerizable material and

(b) at least one ionoperm polymerizable material,

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable mateiral, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized either by (1) an Ionton Ion Permeability Coefficient of greater than about 0.2×10^{-6} cm^2/sec or (2) an Ionoflux Diffusion Coefficient of greater than about 1.5×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions.

52. An ophthalmic lens having a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids without strong adherence to the ocular tissue to inhibit adequate movement on the eye with blinking to promote adequate tear exchange, without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of

wear of at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability equal to or greater than about 69 barrers and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(*a*) *at least one oxyperm polymerizable material and*

(*b*) *at least one ionoperm polymerizable material,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionton Ion Permeability Coefficient of greater than about 8.0×10^{-6} cm^2/sec, wherein said ion permeability is measured with respect to sodium ions.

53. An ophthalmic lens having a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 7 days, said lens comprising a polymeric material which has a high oxygen permeability equal to or greater than about 72 barrers and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(*a*) *at least one oxyperm polymerizable material and*

(*b*) *at least one ionoperm polymerizable material,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration,

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoton Ion Permeability Coefficient of greater than about 250.0×10^{-6} cm^2/sec, wherein said ion permeability is measured with respect to sodium ions, and

wherein said lens has a visible light transmission of at least 80% without any significant undesirable image distortion.

54. An ophthalmic lens comprising a core material surrounded, at least in part, by a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces which are more hydrophilic and lipophobic than the core material, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids without strong adherence to the ocular tissue to inhibit adequate movement on the eye with blinking to promote adequate tear exchange, without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 30 days, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(*a*) *at least one oxyperm polymerizable material and*

(*b*) *at least one ionoperm polymerizable material,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoton Ion Permeability Coefficient of greater than about 350.0×10^{-6} cm^2/sec wherein said ion permeability is measured with respect to sodium ions.

55. An ophthalmic lens comprising a core material surrounded, at least in part, by a surface modified by a plasma surface treatment process, said lens having ophthalmically compatible inner and outer surfaces having greater surface hydrophilicity than the core material of said lens, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(*a*) *at least one oxyperm polymerizable material and*

(*b*) *at least one ionoperm polymerizable material,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoflux Diffusion Coefficient of greater than about 6.4×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions.

56. An ophthalmic lens having ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(*a*) *at least one oxyperm polymerizable material and*

(*b*) *at least one ionoperm polymerizable material,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration,

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoflux Diffusion Coefficient of greater than about 2.6×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions, and

wherein said lens is autoclaved without lowering either said oxygen permeability or said ion permeability below levels sufficient to maintain good corneal health and on-eye movement.

57. An ophthalmic lens comprising a core material surrounded, at least in part, by a surface modified by a plasma surface treatment process, said lens having ophthalmically compatible inner and outer surfaces having greater surface hydrophilicity than the core material of said lens, said lens being plasma surface treated in the presence of (a) a C_{1-6} alkane and (b) a gas selected from the group consisting of nitrogen, argon, oxygen and mixtures thereof, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising:

(*a*) *at least one oxyperm polymerizable material and*

(*b*) *at least one ionoperm polymerizable material,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm polymerizable material forms a phase or phases substantially separate from the phase or phases formed by said ionoperm polymerizable material,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm polymerizable material, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration, and

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoflux Diffusion Coefficient of greater than about 6.4×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions.

58. An ophthlamic lens of claims 49, 50, 51, 52, 53, 54, 55 or 57, wherein said lens is produced by a manufacturing method without lowering either said oxygen permeability or said ion permeability below levels sufficient to maintain good corneal health and on-eye movement.

59. An ophthalmic lens having a surface modified by a surface treatment process, said lens having ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing signficiant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising at least one polymerizable material comprising:

(*a*) *at least one oxyperm segment; and*

(*b*) *at least one ionoperm segment,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm segment forms a phase or phases substantially separate from the phase or phases formed by said ionoperm segment,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfort is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm segment, if polymerized alone, would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration,

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoton Ion Permeability Coefficient of greater than about 8.0×10^{-6} cm^2/sec, wherein said ion permeability is measured with respect to sodium ions, and

wherein said lens does not have any significant undesirable image distortion.

60. An ophthalmic lens having ophthalmically compatible inner and outer surfaces, said lens being suited to extended periods of wear in continuous, intimate contact with ocular tissue and ocular fluids with adequate movement on the eye with blinking to promote adequate tear exchange and without producing significant corneal swelling, without having substantial amounts of lipid adsorption, and without causing substantial wearer discomfort during a period of wear of at least 24 hours, said lens comprising a polymeric material which has a high oxygen permeability and a high ion permeability, said polymeric material being formed from polymerizable materials comprising at least one polymerizable material comprising:

(*a*) *at least one oxyperm segment; and*

(*b*) *at least one ionoperm segment,*

wherein said lens allows oxygen permeation in an amount sufficient to maintain corneal health and wearer comfort during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said oxyperm segment forms a phase or phases substantially separate from the phase or phases formed by said ionoperm segment,

wherein said lens allows ion or water permeation via ion or water pathways in an amount sufficient to enable the lens to move on the eye such that corneal health is not substantially harmed and wearer comfrot is acceptable during the period of extended, continuous contact with ocular tissue and ocular fluids,

wherein said ionoperm segment, if polymerized alone would form a hydrophilic polymer having a water content of at least 10 weight percent upon full hydration,

wherein said ophthalmic lens has an oxygen transmissibility of at least about 70 barrers/mm and an ion permeability characterized by an Ionoflux Ion Permeability Coefficient of greater than about 6.4×10^{-6} mm^2/min, wherein said ion permeability is measured with respect to sodium ions, and

wherein said lens is autoclaved without lowering either said oxygen permeability or said ion permeability below levels sufficient to maintain good corneal health and on-eye movement.

61. An ophthalmic lens of claims 49, 50, 51, 52, 59 or 60, wherein said ophthalmic lens has an oxygen transmissibility of at least about 75 barrers/mm.

62. An ophthalmic lens of claims 49, 50, 51, 52, 59 or 60, wherein said ophthalmic lens has an oxygen transmissibility of at least about 87 barrers/mm.

63. An ophthalmic lens of claims 49, 50, 51, 52, 53, 54, 55, 57, or 59 wherein said lens is autoclaved without lowering either said oxygen permeability or said ion permeability below levels sufficient to maintain good corneal health and on-eye movement.

64. An ophthalmic lens of claim 49, 50, 51, 52, or 59 wherein said surface treatment process is a plasma surface treatment process and said period of extended wear is at least 7 days.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. :

DATED : June 2, 1998

INVENTOR(S) :

Nicolson, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Col. 11, ln. 43 reads "$6.4x10^{6}$" and should read –$6.4x10^{-5}$–

Col. 69, ln. 26 reads "lens having ophthalnically compatible" and should read –lens having ophthalmically compatible–

Col. 69, ln. 39 reads "wherein said oxyperm polymerizablea" and should read –wherein said oxyperm polymerizable–

Col. 69, ln. 40 reads "phases substantially seperate" and should read –phases substantially separate–

Col. 69, ln. 46 reads "substantially hared" and should read –substantially harmed–

Col. 69, ln. 49 reads "wherein said ionoperm polyrnerizable" and should read –wherein said ionoperm polymerizable–

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,760,100

DATED : June 2, 1998

INVENTOR(S) : Nicolson, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Col. 69,ln. 51 reads "a water content of atleast" and should read --a water content of at least--

Col. 69, ln. 55 reads "permeability characteized" and should read --permeability characterized--

Col. 69, ln. 58 reads "greater than about $1.5x10^{31\ 6}$" and should read --greater than about $1.5x10^{-6}$--

Col. 70, ln. 57 reads "ability Coefficeint" and should read --ability Coefficient--

Col. 70, ln. 59 reads "an Ionoflux Diffuision" and should read --an Ionoflux Diffusion--

Col. 71, ln. 30 reads "An ophthlamic lens" and should read --An ophthalmic lens--

Col. 71, ln. 32 reads "any clinically signficant" and should read "any clinically significant--

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,760,100

DATED : June 2, 1998

INVENTOR(S) : Nicolson, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Col. 72, ln. 67 reads "Coeffecient of greater than about $0.2x10^{31\,6}$" and should read --Coefficient of greater than about $0.2x10^{-6}$--

Col. 73, ln. 2 reads "about $1.5x10^{-6}mm^2min.$" and should read --about $1.5x10^{-6}mm^2/min.$--

Col. 73, ln. 3 reads "with respect to sodiumn ions." and should read --with respect to sodium ions.--

Col. 74, lns. 3 and 4 reads ""Ion Pemeability Coefficient" and should read --Ion Permeability Coefficient--

Col. 71, ln. 60 reads "lens of claim 26" and should read --lens of claim 36--

Col. 71, ln. 66 reads "lens of claim 26" and should read --lens of claim 36--

Col. 72, ln. 7 reads "$cm^2/min.$" and should read --$cm^2/sec.$--

Col. 72, ln. 9 reads "lens of claim 1" and should read --lens of claim 36--

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,760,100

DATED : June 2, 1998

INVENTOR(S) : Nicolson, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Col. 72, ln. 31 reads "cm^2/min." and should read --cm^2/sec.--

Col. 72, ln. 49 reads "said oxyperm polymerizable mateerial forms" and should read --said oxyperm segment forms--

Col. 72, ln. 52-53 reads "said ionoperm polymerizable material." and should read --said ionoperm segment.--

Col. 72, ln. 60 reads "said ionoperm polymerizable material." and should read --said ionoperm segment.--

Signed and Sealed this

Fifteenth Day of June, 1999

Attest:

Q. TODD DICKINSON

Attesting Officer

Acting Commissioner of Patents and Trademarks